

Periscope.

a.—ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.

THE FUNCTIONS OF THE BRAIN.—The following are the conclusions of a lengthy memoir by Luciani and Tamburini in the *Rivista Sperimentale*:

1. The excitable area of the cerebral cortex presents in dogs and cats, as well as in apes, considerable differences of disposition and boundaries, not only between different animals, but between the two hemispheres of the same animal.
2. We can establish in the dog by electric irritation, two distinct centres in the sigmoid gyrus for opposed movements for both anterior and posterior limbs.
3. In apes the excitable area for the members and the face is not limited solely to the ascending frontal convolution, as Hitzig claims, but extends also to the ascending parietal, the angular gyrus, etc., as Ferrier has shown.
4. The existence of a special epileptogenic zone in a fixed and definite cortical area is inadmissible, but, under proper conditions, the excitation in any excitable area whatever may cause an epileptic attack, which commonly begins in convulsions limited to the groups of muscles from the centres for which emanates the irritation.
5. The different excitable areas seem variously scattered, probably on account of their being endowed with different degrees of excitability. This may be presumed for many reasons, and especially that to produce a complete epileptic attack, acting on the same, requires a different intensity of the electric current.
6. It is absolutely impossible that the movements produced by electrization of the cortex can be due to a diffusion of the current to the dura mater.
7. The hypothesis that the movements produced by electrization of the cortical zone may be of reflex nature, in that there are in the excitable area so many sensory centres for the different parts of the body, does not stand against the facts of the decomposition, co-ordination to an end, and constancy of these, since the movements produced reflexly by peripheral excitation do not ever have such characters.
8. The phenomena of lost motility produced by ablation of the excitable zone, are of an absolutely paralytic, not ataxic nature.
9. The aforesaid paralytic phenomena are transitory, but they last the longer, that is the compensation takes place the more slowly, as we ascend in the animal scale.
10. To explain the recovery of the paralytic phenomena, the idea is inadmissible of a functional substitution of a neighboring area, or of the opposite hemisphere, nor can we say that the psycho-motor function is located in

the basal centres, but it is needful to admit that these last may physiologically be centres of voluntary motion, since the development or perfection of this their function produces the cure of the paralytic phenomena, and produces it all the more quickly the more developed this function is normally.

A. PITRES, *Thèse de Doctorat*, Paris, 1878 (abst. in *Revue des Sciences Médicales*).

To show that lesions of the subcortical white substance produce exactly the same effects as those of the convolutions, is the object of this important memoir. In order to fulfill it, M. Pitres insists in his first part on the possibility of subdividing and describing this apparently homogeneous *centrum ovale*, and first he divides it into three zones: prefrontal or anterior, occipito-sphenoidal, and fronto-parietal. This last zone, according to Pitres, is limited by two vertical planes: the one passing within five centimetres of the fissure of Rolando, the other passing one centimetre in front of the internal perpendicular fissure. Situated between the opto-striate bodies and the alleged motor convolutions, this median zone of the *centrum ovale* may be subdivided into four regions: pediculo-frontal, frontal, parietal and pediculo-parietal, each corresponding to four parallel vertical planes, carried to the foot of the three frontal convolutions to the frontal, the ascending parietal and the foot of the parietal lobules. Finally, each of these regions may be considered as itself formed of numerous bundles; thus in the pediculo-frontal we distinguish three: the superior, median and inferior.

This artificial limitation permits M. Pitres to classify the lesions of the *centrum ovale*, by comparing them to the superjacent convolutions; and in a second part he is then able to usefully analyze the numerous clinical observations. He first shows that lesions of the prefrontal zone, like those of the occipital, never cause any disorder, either motor or sensory, at least not directly, in the absence of complications. Lesions of the fronto-parietal zone alone, have, in the majority of cases, produced hemiplegic motor disorders, and sometimes also monoplegias. The existence of these monoplegias from injury to the *centrum ovale*, of numerous cases of aphonia from destruction of the left lower pediculo-frontal bundles, of brachial monoplegia from lesion of the upper and middle frontal bundles, etc., prove that the anatomical dissociation made by M. Pitres is true also functionally. The white substance of the centrum, in spite of its apparent homogeneity, is formed of bundles, each adapted to special conduction; in the fronto-parietal zone, the sole conductor of movements, the white bundles of fibres remain functionally distinct like the convolutions from whence they come; in fine, the lesions of the centrum and those of the superjacent convolutions produce exactly the same disorders.

It is to establish this last conclusion that M. Pitres gives the third part of his memoir. He shows that lesions of the centrum, like those of the fronto-parietal convolutions, are often latent; that the paralyses are often transient and incomplete, or progressive; that they are often preceded or accompanied by contractures, or even by epileptic convulsions; that, finally, they may be followed by slow contracture with secondary degeneration. He